

CHROMOSOME COUNTS IN THE GENUS *MIMULUS* (SCROPHULARIACAE)

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Although our long range investigation concerns the evolution of species in sections *Simiolus* and *Erythranthe* of the genus *Mimulus* (Vickery, 1951), we have recently made genetical and cytological studies of several species belonging to other sections of the genus. The crossing results have already been given (Vickery, 1956), and this paper presents the cytological findings.

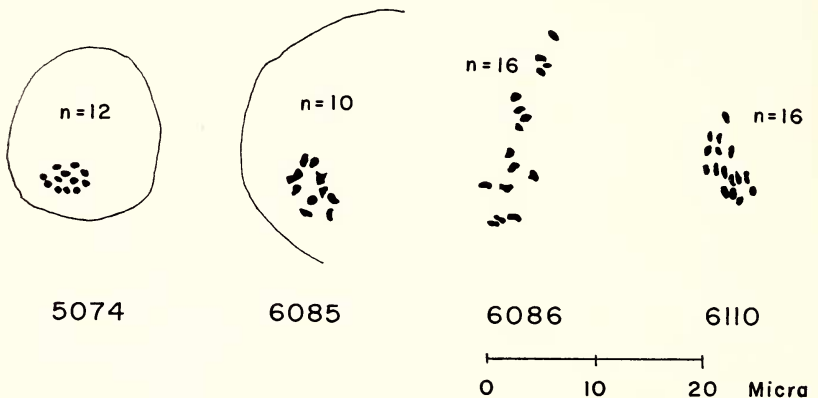


FIG. 1. Meiotic chromosomes of *Mimulus ringens* (5074), *M. aurantiacus* (6085), *M. moschatus* (6086) and *M. floribundus* (6110). All configurations are in or near second metaphase. Camera lucida drawings were made at $\times 2,520$ and reduced to $\times 1,260$ in reproduction.

The same method of bud fixation was employed as in previous investigations (Mukherjee and Vickery, 1959, 1960). Each chromosome number determination was based on counts from an average of nine pollen mother cells. Herbarium specimens of each culture will be deposited in the Garret Herbarium of the University of Utah (UT).

Four species, representing three sections of the genus, were studied: *Mimulus ringens* L. of section *Eumimulus*; *M. aurantiacus* Curt. of section *Diplacus*; and *M. moschatus* Dougl. and *M. floribundus* Dougl., both of section *Paradanthus* (see table 1 and figure 1).

The count of $n = 12$ for blue flowered *M. ringens* of eastern North America, type species of the genus, differs from any previously reported for the genus (Campbell, 1950; Carlquist, 1953; Darlington and Wylie, 1955; McMinn, 1951; Mukherjee and Vickery, 1959, 1960; Mukherjee, Wiens, and Vickery, 1957a, 1957b; and Vickery, 1955). However, *M. ringens* is the only species so far counted in section *Eumimulus*, and additional counts of $n = 12$ are possible in this section.

Shrubby *M. aurantiacus* of the chaparral areas of central and northern California was found to have $n = 10$ chromosomes, as do other

TABLE 1. CHROMOSOME COUNTS IN THE GENUS MIMULUS.

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|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| n = 12 | <i>M. ringens</i> L., section <i>Eumimulus</i> . St.-Jean, St.-Jean County, Province of Quebec, altitude ca. 200 feet, <i>M. Raymond</i> and <i>J. Kucyniak</i> , summer 1951 (5074). |
| n = 10 | <i>M. aurantiacus</i> Curt., section <i>Diplacus</i> . Near Round Top, Alameda County, California, altitude 1,200 feet, <i>Vickery 990</i> (6085). |
| n = 16 | <i>M. moschatus</i> Dougl., section <i>Paradanthus</i> . Mill Creek Canyon, Salt Lake County, Utah, altitude 7,400 feet, <i>Vickery 1036</i> (6086). |
| n = 16 | <i>M. floribundus</i> Dougl., section <i>Paradanthus</i> . Hog Ranch, Mather, Tuolumne County, California, altitude 4,600 feet, <i>Vickery 1372</i> (6110). |

species of section *Diplacus* previously reported by McMinn (1951). McMinn's extensive crossing studies suggest that this number, not found in other sections of the genus, is characteristic of section *Diplacus*.

Mimulus moschatus and *M. floribundus*, both widespread in western North America, were found to have $n = 16$ chromosomes. Both species have small yellow flowers and are low-growing with viscid-pubescent leaves and stems, but they differ markedly in leaf size and shape and in duration (*M. floribundus* is annual; *M. moschatus* is perennial). The two species hybridized readily in the garden. The F_1 hybrids were vigorous, but completely sterile (Vickery, 1956). Despite the cytological and some morphological similarities, these two entities would appear to be genetically and taxonomically distinct.

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